

# PIP-II

## Project Director Report



July 2022



### PROJECT HIGHLIGHTS

- P2PEB#12 held July 11
- 2nd PIP-II Technical Meeting held July 12–14
- Validation of LB650 Cavity in STC
- ASPIRE students make progress
- Laclare Prize awarded to David Longuevergne

### UPCOMING EVENTS

10 August

DOE/OPA Review of the Linac construction package

5–9 Sept.

Fermilab Director, PIP-II leadership visit to India

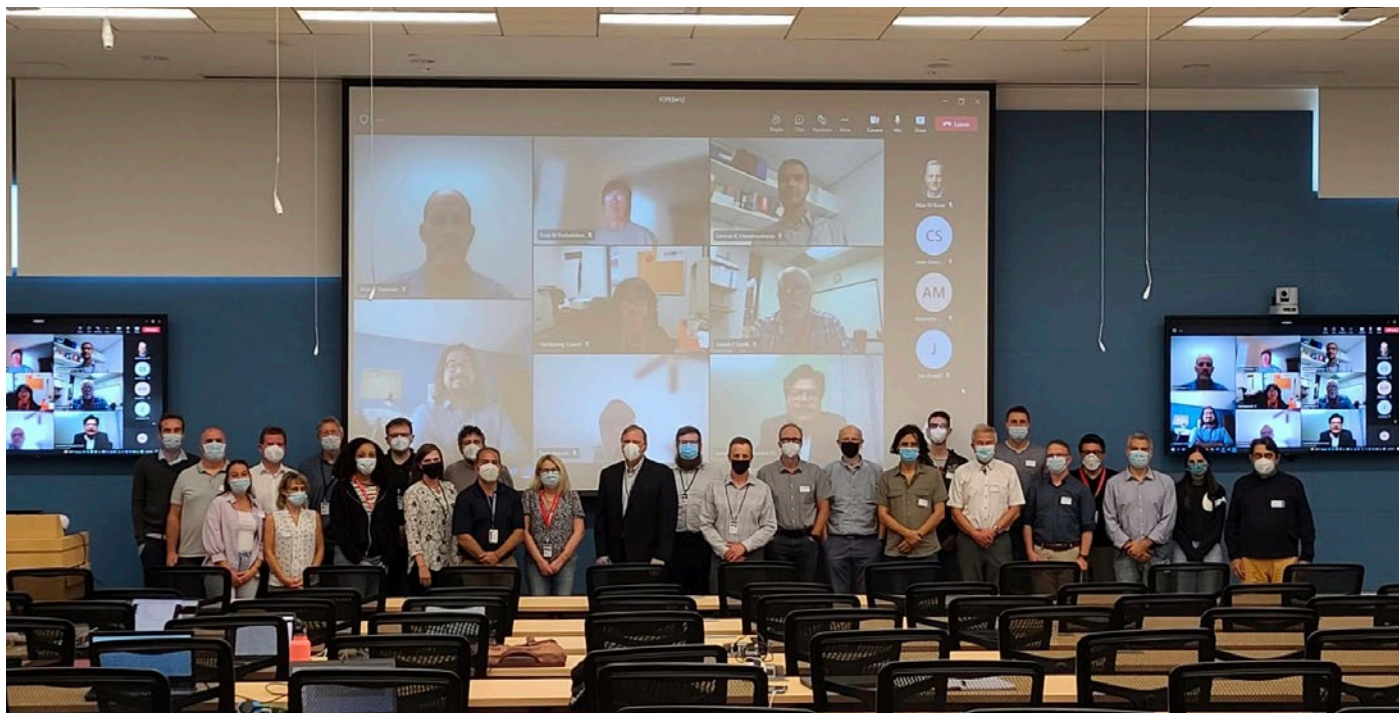
Aug.–Sept.

FDRs for RF Distribution, 20kW Amplifier, Booster Collimator, Beam Transfer Line Collimators

## P2PEB#12 held July 11

The 12th PIP-II Executive Board meeting was held July 11 at Fermilab with about 50 registered participants. All European technical coordinators attended in person, while a number of Fermilab and other IKC participants connected remotely. P2PEB#12 focused on creating acceptance plans

and an acceptance criteria completion plan, approved unit and codes, design reviews in the near future, and the geopolitical situation in the EU and its potential impacts on the project.



Group photo from P2PEB#12. Photo credit: Jamila Adetunji



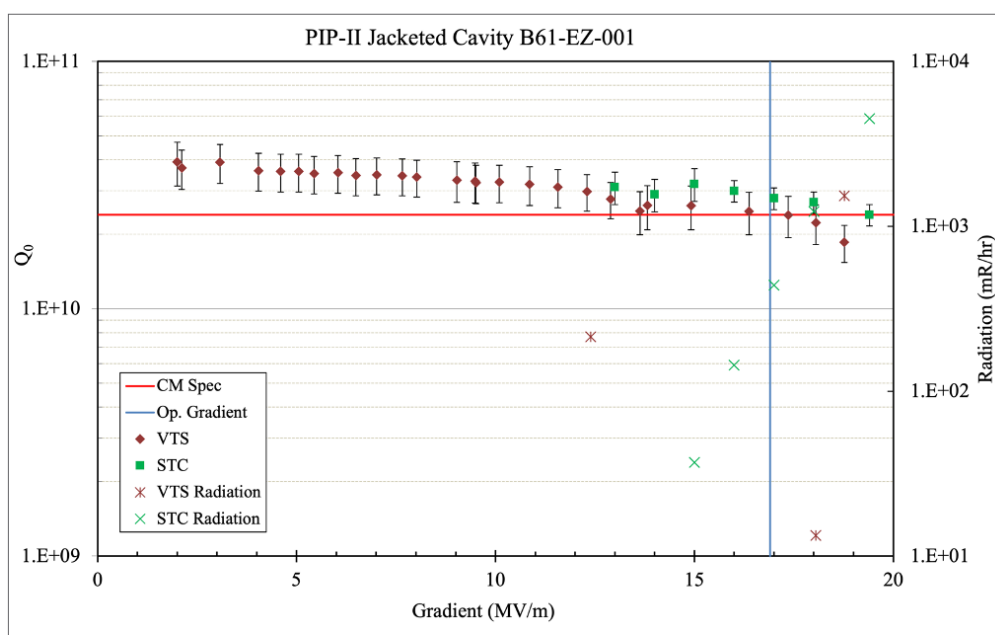
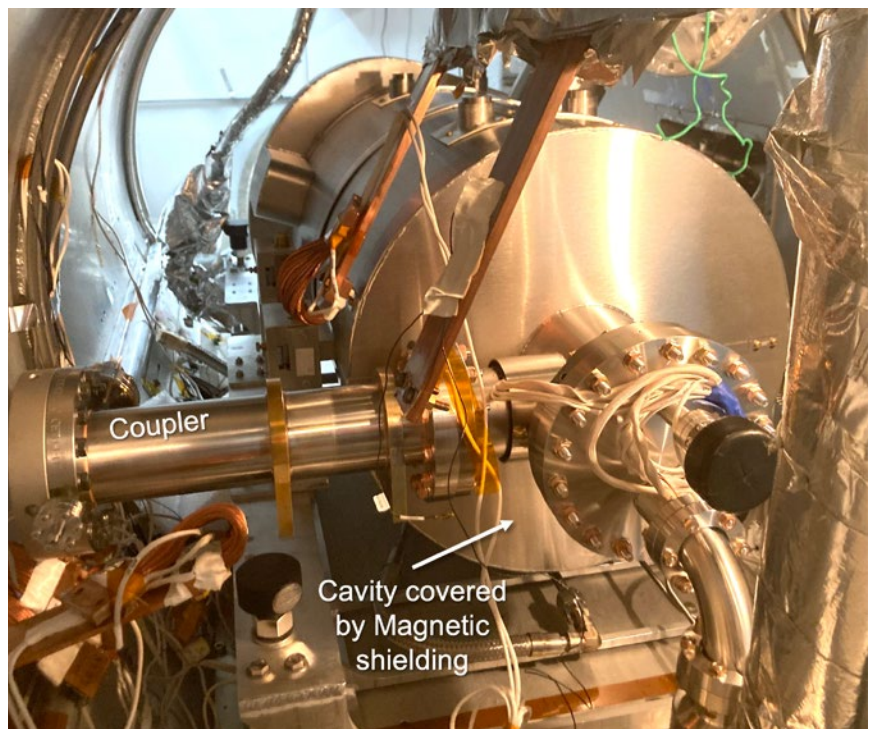
## 2nd PIP-II Technical Meeting held July 12–14

The second-ever PIP-II Technical Meeting was held July 12–14 at Fermilab. Several of the 231 registered participants were able to attend in person, including 29 partner visitors, while the rest joined remotely. This meeting was focused on production post-CD-3, and session topics covered RF coupler production, managing technology

obsolescence, HB650 cryomodule production, 650 MHz cavity processing and testing, and cryogenic distribution system interfaces and analysis. More information is available on the Indico sites for the [meeting](#) and the [plenary closeout](#) from July 25.

## Validation of LB650 Cavity B61-EZ-001 in STC

The first  $\beta=0.61$ , 650 MHz (LB650) cavity for PIP-II, contributed by INFN in Italy, went through the validation process, starting from fabrication at INFN's subcontractor, processing, jacketing and testing at Fermilab. This cavity is the result of an active, energetic and successful collaboration of LB650 cavity partners including Fermilab, INFN and DAE/VECC in India. The cavity underwent the traditional 800 °C heat treatment followed by 120 °C baking as a control for processing recipe. This first cavity was tested in a vertical test stand (VTS) and in a horizontal test stand (STC). In STC, the cavity is mounted with a high-power RF coupler, a tuner and magnetic shielding, simulating a 1-cavity cryomodule (CM). The measure of efficiency, the quality factor ( $Q_0$ ), is plotted as a function of the accelerating gradient in the graph below. Incorporating fast cool downs and conditioning, VTS performance was conserved at STC.



## ASPIRE students make progress

Accelerator Science Program to Increase Representation in Engineering, or ASPIRE, is a Fermilab fellowship providing immersive learning experiences to undergraduate and graduate engineering students who are historically and contemporarily underrepresented in accelerator engineering fields. The 2022 cohort is participating in the design, development and construction of PIP-II; here are updates from three of this year's six ASPIRE fellows:

**Parker Landon** completed her work on Rear Transition Module (RTM) Testbed Development. Emulating the uTCA front AMC card with a microcontroller on the RTM, Parker successfully developed a state machine to handle I2C bus communication, EEPROM and temperature device function libraries, ADC initialization and a supervisory monitoring thread. This framework was a successful proof of concept and will continue to evolve after a vendor for the uTCA front card

is selected. Throughout the next school year, Parker will work remotely on developing analytical and display tools for the Beam Instrumentation Systems.

**Sana Begum** has been initially tasked with documenting the code developed for the LLRF Beam Pattern Generator. This is but one stage in a larger team effort to develop the interface layer between the FPGA, many Python scripts and the EPICS IOC for LLRF systems.

**Mark Castellanos** is working on the control system of the new conduction cooled test stand being setup in APS-TD IB1. The test stand will be used to qualify the SSR focusing lenses being manufactured by BARC (India). Mark did complete the interface code with the main instrumentation (temperature monitors, Hall probes controllers, power supply and quench detection system) and is now focusing on the user interface.



*Engineer Tiffany Price (left) gave DOE Office of Science Director Asmeret Berhe and others a tour of the test facility for PIP-II particle accelerator components on July 8. Berhe was also presented with an overview of Fermilab's immersive ASPIRE Fellowship Program. Photo credit: Tom Nicol*

## Laclare Prize awarded to David Longuevergne



PIP-II's CNRS/IN2P3 technical coordinator David Longuevergne has been awarded a Laclare Prize. The Jean-Louis Laclare Prize is intended to reward a young physicist (younger than 40 years old) for his or her outstanding work in physics or accelerator technology. The prize is awarded every year by the Accelerator Division of the French Physical Society, which aims to bring together the academic, scientific and industrial actors of the FPS involved in the field of particle accelerator. The award ceremony will take place September 13. Congratulations, David!